

REMARKS

Favorable reconsideration in view of the previous amendments and following remarks is respectfully requested.

Claims 1, 7-9 and 11 are pending.

The Office Action rejects claims 1, 7-9 and 11 under 35 U.S.C. §103(a) over JP 61028630 to *Kushida* in view of U.S. Patent No. 5,599,599 to *Mirmiran et al.* This rejection is respectfully traversed.

Applicant's independent 1 claim recites a fibre reinforced polymer outer tube including a majority of fibres oriented generally circumferentially around the fibre reinforced polymer outer tube; a steel inner tube, the steel inner tube being hollow; and a concrete filler material provided between the outer tube and the steel inner tube. These features encompass Applicant's exemplary embodiment illustrated in Fig. 1 wherein a double skin tubular structure member is provided having a fiber reinforced polymer outer tube 2 and an inner tube 3 made from generally metallic materials. A filler material including a bound aggregate material is provided between the outer tube 2 and the inner tube 3. The fibre reinforced polymer outer tube is formed along an entire length of the steel inner tube.

Kushida discloses a steel pipe pile 1 fixed to a supporting member 2 at a section lower than a water level. A pipe like covering material 3 of polymer and pipe-impregnated concrete covers a higher section and is supported by supporting member 2. A space is formed between the inner face of the cover material 3 and the outer face of the steel pipe pile 1. Seawater in the space 4 is discharged and the space is filled with composite cement 10. *Kushida* is directed to the use of the pipe like covering material of polymer impregnated concrete to cast a composite cement

cover on a steel pipe for corrosion prevention. In particular, the purpose of the *Kushida* reference is to provide a method to protect a steel tube from seawater. Therefore, the outer pipe like material and the filler material only cover the underwater part of the steel tube.

In claim 1, the steel inner tube, the concrete layer (the filler material) and the FRP (fibre reinforced polymer) outer tube work together to resist external loading in a robust and ductile manner. Each of the three components plays a useful role in the load resistance mechanism. The main functions of the three components are as follows: the concrete resists axial compression, the steel tube resists both axial compression and axial tension, and the FRP tube confines the concrete so that the ductility and strength of the concrete are enhanced. This load resistance function cannot be achieved by *Kushida*.

The outer polymer impregnated concrete tube of *Kushida* acts as a form for casting composite cement. The concrete pipe needs to have a thermal coefficient similar to that of the composite cement and is not required to resist any significant circumferential tensile force. Thus, the ordinarily skilled artisan would not be motivated to replace the polymer impregnated concrete with an FRP tube (fiber reinforced polymer) including a majority of fibers oriented generally circumferentially around the fiber reinforced polymer outer tube as in Applicant's independent claim 1. Such a FRP tube would have no useful function within the context of *Kushida's* objective.

The filler composite cement of *Kushida* used to protect the steel pipe normally has a thickness of around 100 mm regardless of the dimension of the steel tube. In claim 1, the concrete filler material provides load resistance and its thickness

depends on the specific application and should always be compatible to the dimensions of the steel tube.

Mirmiran does not overcome the deficiencies of *Kushida* noted above.

Mirmiran discloses an exterior filament wound shell 12 including an interior protruded portion 14 consisting of combinations of fiber and resin. The exterior film and shell provides a form for a concrete core 18. As discussed above, the ordinarily skilled artisan would not have been motivated to combine the exterior filament wound shell 12 of *Mirmiran* with *Kushida*.

Thus, Applicant respectfully requests withdrawal of the rejection of claim 1. Claim 9 is allowable for reasons similar to those presented above with respect to claim 1.

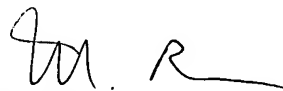
Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

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